The hybrid population of Pied Crow *Corvus albus* and Somali Crow *C. edithae* on Dahlak Kebir Island, Eritrea: a case of assortative mating?

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Une population hybride du Corbeau pie *Corvus albus* et du Corbeau d'Edith *C. edithae* sur l'île Dahlak Kebir, Eritrée: un cas d'accouplements entre oiseaux du même type? A l'intérieur de la zone hybride du Corbeau pie *Corvus albus* et du Corbeau d'Edith *C. edithae*, l'île Dahlak Kebir héberge des oiseaux nicheurs de coloration intermédiaire qui peuvent être distingués selon les types 'Corbeau pie' ou 'Corbeau d'Edith'. Des observations limitées semblent indiquer que les couples étaient constitués d'oiseaux du même type plutôt que d'oiseaux de types différents et que les oiseaux du type 'Corbeau d'Edith', moins nombreux, restaient souvent sans partenaire. Etant donné que toute autre barrière est improbable sur cette île aride plate, l'action d'éviter le type différent semble limiter l'hybridation.

Hybrid zones between populations of appreciably different, but closely related, birds are of considerable interest in efforts to understand species evolution. There is, however the taxonomic problem of whether to consider the hybridising forms subspecies, should they interbreed, or species, when hybridisation is limited (Newton 2003). That hybrids are rare in the wild suggests the existence of strong species-recognition mechanisms, ensuring that birds normally pair only with individuals of their own species. These isolating mechanisms would clearly be adaptive as far as they prevented the production of unviable, infertile or otherwise unfit hybrids between true species. However, there is no reason why the same mechanisms should not act at subspecific levels, provided that individuals detected sufficient difference from their 'species' model. Such mechanism would result in assortative mating within the species. A crow hybrid zone is well known for Europe, where Carrion Crow *Corvus* (*corone*) *corone* and Hooded Crow *C.* (*corone*) *cornix* meet. Rather extensive studies have not yet elucidated why this hybrid zone is persistently narrow, despite hybrid fertility (for a review, see Parkin *et al.* 2003). Whilst ecological differences between the pure forms, with reduced fitness of the hybrids outside the hybrid zone, has appeared to be the principal reason (Saino & Villa 1992), avoidance of the different bird type has also been suggested, to explain an observed tendency to form pairs and flocks of similarly coloured birds within the hybrid zone (Rolando & Laiolo 1994). The tendency to form pairs of the same type among Carrion and Hooded Crows inhabiting Amrum, a Frisian flat islet, has cast some doubt as to the importance of ecological separation (Risch & Andersen 1998).

Formerly called Dwarf Raven, and considered a smaller subspecies of Brown-necked Raven *Corvus ruficollis* or even Northern Raven *C. corax*, Somali Crow *C. edithae* has been subsequently recognised as a closer relative of Pied Crow *C. albus* (North 1962, Londei 1995). Somali Crow differs from Brown-necked Raven in shape, voice and behaviour, and the latter's bill is less arched,

Table 1. Pied-type and Somali-type crows, paired or unpaired, counted at two localities on Dahlak Kebir

Tableau 1. Oiseaux des types 'Corbeau pie' et 'Corbeau d'Edith', en couples ou solitaires, comptés en deux localités de l'Île Dahlak Kebir

	Pied	Somali				
	With Pied	With Somali	Unpaired	With Somali	With Pied	Unpaired
Luul (1st count)	14	1	5	2	1	2
Luul (2nd count)	10	2	3	2	2	3
Afar village	10	0	5	0	0	2

more dagger-like, which is easily noticed on photographs (pers. obs.). Whilst Pied Crow is widespread over most of sub-Saharan Africa, Somali Crow is restricted to the Horn of Africa. Here their ranges marginally overlap and hybrids occur (Ash 1983, Ash & Miskell 1998, Urban 2000). Concerning the Arussi plateau, in Ethiopia, Blair (1961) noted, 'within the critical area mixed flocks are common, but pure flocks would nevertheless be commoner'. Pied and Somali Crows are very similar to each other in size, shape, voice and behaviour, but they noticeably differ in coloration, Pied Crow being black and white and Somali Crow all black. In a previous paper (Londei 1995) I suggested that, although they seemed to differ in ecology (Wilson 1990), this might simply reflect the degree of their geographical separation. Thus it would be interesting to assess the degree of their hybridisation where any ecological difference was unlikely. Just off the Eritrean coast, the island of Dahlak Kebir stretches more than 50 km and consists of a limestone shelf only a few metres above sea level. A resident, interbreeding population of Pied and Somali Crows has been present since at least Zedlitz's (1911) record of variously 'melanistic' Pied Crows together with 'normal' ones (birds observed and collected in 1909). As usual with Pied and Somali Crows, these crows keep close to settlements, which are few on this barren island (pers. obs.).

I was on Dahlak Kebir between 24 and 27 February 2004, when nest building had commenced and birds kept close to their mates when moving around the island. Having found too few nests to make any estimate of interbreeding from the pairs nearby, I looked at birds in transit between different areas of the island. I chose suitable places and times when most birds would be flying in the same direction, and used short observation periods (*c*.15 minutes) to avoid double

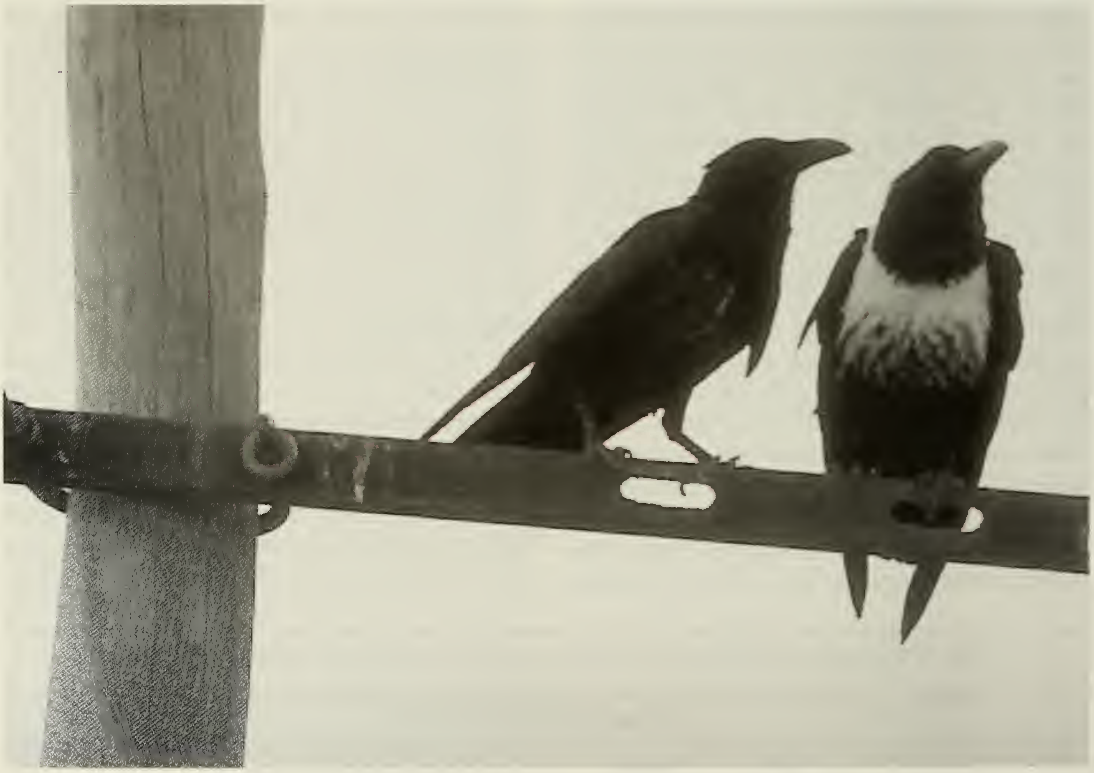

Figure 1. Pied-type (right) and Somali-type crows paired, a less frequent sight. Hybrid traits are evident in both. Luul Resort, Dahlak Kebir Island, Eritrea, 26 February 2004 (Tiziano Londei)

Un couple mixte des types 'Corbeau pie' (à droite) et 'Corbeau d'Edith', un cas peu fréquent. Les traits hybrides sont apparents chez les deux oiseaux. Luul Resort, Île Dahlak Kebir, Eritrée, 26 février 2004 (Tiziano Londei) counts. Reliable counts were obtained twice (on different days) near Luul Resort, where crows flew in the direction of a military base, and once near a settlement of Afar pastoralists, 14 km to the south-east, with crows moving towards the village. Although some birds appeared to be pure Pied or Somali Crows, most showed intergrading coloration, but true intermediates were rare. Thus, I considered all birds as being either Pied-type or Somali-type (Fig. 1), the distinguishing criterion being the presence or absence of white on the hindneck, i.e. a complete white collar. The existence of several crow species with a pale collar and appropriate behaviour used in displaying this feature (pers. obs. for Pied and Hooded Crows) suggests that this is an important trait for species recognition. I counted Pied-type and Somali-type birds moving in pairs, as well as isolated birds, which I assumed to be unpaired.

Although too few for reliable statistical analysis, the data from the three counts (Table 1) consistently suggest that (1) pairs of the same type were more frequent than expected from the relative abundance of that type (Pied being *c.*4 times commoner than Somali), and pairs of different types, less; and (2) the less-abundant, Somali-type birds were more frequently unpaired. Such results are best explained by assortative mating. The Pied or Somali type, or both, would prefer to form pairs with birds of the same type. Given the less frequent occurrence of the Somali-type in the mixed population, birds of this type would less frequently meet with each other and thus they would more often remain unpaired. The reverse might occur in areas where Pied was in the minority (the other side of the hybrid zone), thus keeping the hybrid zone stable. As on the island of Amrum, in the case of Carrion and Hooded Crows (Risch & Andersen 1998), my data from Dahlak Kebir suggest a stable hybrid zone with no problems, either for the hybrids or the parental forms, in terms of fitness. However, assortative mating would limit the hybridisation itself.

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References

Ash, J. S. 1983. Over fifty additions of birds to the Somalia list including two hybrids, together with notes from Ethiopia and Kenya. *Scopus* 7: 54–79.

Ash, J. S. & Miskell, J. E. 1998. *Birds of Somalia.* Robertsbridge: Pica Press.

Blair, C. M. G. 1961. Hybridization of *Corvus albus* and *Corvus edithae* in Ethiopia. *Ibis* 103a: 499–502.

Londei, T. 1995. Field notes on corvids in Ethiopia. *Bull. Brit. Orn. Club* 115: 164–166.

Newton, I. 2003. *The Speciation and Biogeography of Birds.* London, UK & San Diego: Academic Press.

North, M. E. W. 1962. Vocal affinities of *Corvus corax edithae*, “Dwarf Raven” or “Somali Crow”? *Ibis* 104: 431.

Parkin, D. T., Collinson, M., Helbig, A. J., Knox, A. G. & Sangster, G. 2003. The taxonomic status of Carrion and Hooded Crows. *Br. Birds* 96: 274–290.

Risch, M. & Andersen, L. 1998. Selektive Partnerwahl der Aaskrähe (*Corvus corone*) in der Hybridisierungszone von Rabenkrähe (*C. c. corone)* und Nebelkrähe (*C. c. cornix*). *J. Ornithol.* 139: 173–177.

Rolando, A. & Laiolo, P. 1994. Habitat selection of Hooded and Carrion Crows in the alpine hybrid zone. *Ardea* 82: 193–200.

Saino, N. & Villa, S. 1992. Pair composition and reproductive success across a hybrid zone of Carrion Crows and Hooded Crows. *Auk* 109: 543–555.

Urban, E. K. 2000. Family Corvidae. In Fry, C. H., Keith, S. & Urban, E. K. (eds.) *The Birds of Africa.* Vol. 6. London, UK: Academic Press.

Wilson, R. T. 1990. Comparative ecology of the Corvidae in Ethiopia. *J. Afr. Zool.* 104: 593–601.

Zedlitz, O. 1911. Meine ornithologische Ausbeute in Nordost-Afrika. *J. Orn.* 59: 1–92.

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